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I place on each side of the grind-stone a flat ring of iron, or other metal, wrought or cast, about half an inch thick. To each ring I add a strong gripe, or bracing piece with screws, formed of a strong circular plate of iron, or other metal, corresponding in diameter with the rings before described. Each gripping piece must have a hole in its center, of a proper size and figure to admit the spindle of the grind-stone. And also as near as convenient to and round the circular edges of each griper or bracing piece, I cause holes to be made at small distances, of a proper size and form to receive or admit screwed nuts or burs fitted and screwed to them so as to hold and admit of strong screw pins or bolts, which must be made to screw pointedly, or in a direct manner towards the before described rings and grind-stone. The bracing pieces may be made occasionally without the nuts, as their necessity depends upon those plates being made of cast iron. The gripes or bracing plates being made, I then place them upon the rings, one at each side of the grind-stone, the spindle of the said grind-stone passing through them all, which are then to be secured completely tight and firm to their places by cotters through, or screws fixed to, the spindle of the grind-stone, on the outside of the whole gripping or bracing pieces on or against the rings or washers, so as to press, and hold the grind-stone between the apparatus on both its sides.

Patent of Mr. Benjamin Flight, of St. Martins Lane, Westminster, Organ Builder for a Metal Nave, Axle, and Box for Wheel carriages.

Dated Sept. 1809.

In this method of securing wheels to the axles, the axle is made hollow for a certain distance at each end, into which hollow part a large pin enters, having a projected head, which keeps the metal nave from being forced off: at its other end this pin has a groove turned on it, in which a cap is made to fit so as that the pin turns round freely with it, and which cap is divided longitudinally, that it may be put on or taken off

when desired; when the cap and pin are in their places within the hollow axle, a bolt passing vertically through the hollow axle and cap keeps the pin from being drawn out, and thereby prevents the wheel from working off. The pin itself is made hollow for the purpose of containing oil; which is put into it by an aperture at the center of its head, and secured from coming out by a screw that fits tight into this aperture; a small hole is drilled through the side of the pin into the oil box through which the oil passes between the pin and axle, the pin being fastened to the nave so as to turn round with it, and the oil being consequently required inside as well as outside the axle.

Observation... There does not seem to be any advantage in the pin being made to turn round with the nave, to counterbalance the disadvantage that must arise from the additional friction which this will occasion, and for the expense of the divided caps and their fitting which this mode of construction makes necessary. If the pin did not turn round, the bolt might pass through its end at once, which would be much simpler. Making the pin of size sufficient to contain an oil box would render it necessary to make the axle of a large size, in order to be sufficiently strong, but it is not certain that this would be so disadvantageous as it might appear, as the friction depends more on the weight of the carriage than on the extent of surface of the axle.

Mr Davy's Discoveries relative to Muriatic Acid.

Phil. Mag. 36, 152.

The conclusions drawn by Mr. Davy from the series of facts contained in the valuable paper which he read before the Royal Society (and of which an account was given in our last number) are highly deserving of attention, and are as follows:

1st. The oxy-muriatic acid is, (as far as our knowledge extends) a *simple substance*, which may be classed in the same order of natural bodies as oxygen gas; being determined like oxygen to the positive surface in Voltaic combinations, and like oxygen,

combining with inflammable substances, producing light and heat.

2dly. That its combinations with inflammable bodies are analogous to oxides and acids in their properties, and powers of combination, but they differ from them in being for the most part decomposable in water.

3dly. That hydrogen is the basis of the muriatic acid, and oxymuriatic acid its acidifying principle.

4thly. That the compounds of phosphorus, arsenic, tin, &c. with oxymuriatic acid, approach in their nature to acids, and neutralize ammonia, and other salifiable bases.

5thly. That the combination of ammonia with phosphorus acidified by oxymuriatic acid, is a peculiar compound, having properties like those of an earth, and is not decomposable at an intense red heat.

6thly. That oxymuriatic acid has a stronger attraction for most inflammable bodies than oxygen; and that on the hypothesis of the connexion of electrical powers with chemical attractions, it must be highest in the scale of negative power; and that the oxygen, which has been supposed to exist in oxymuriatic acid has always been expelled by it from water or oxides.

The following errata arising from the original paper on this subject, are to be corrected in our last. p. 146, l. 43, for nine read nice, and l. 46, for nine read some.

On the Art of Printing on Stone, by G.O. Phil. Journal, xxvi. 317.

The following circumstances respecting the art of printing on stone, which seem of considerable utility, and which have not been noticed by M. De Serres, in the paper inserted in our former number, are mentioned by G.O.

He tried the ink made according to M. De Serres direction (which was considered so great a secret) but he prefers to it coloured turpentine, copal or lac varnish. Muriatic acid he finds preferable to the nitric, as it both has the advantage of not acting upon the resin or wax, which forms the base of the varnish used, and is cheaper.

After purchasing some pieces of

marble, he was very much vexed to find that both the muriatic and nitric acid left some veins untouched, and only partially dissolved others; this must be attended to in selecting the blocks. He finds some pieces of the limestone from Clifton near Bristol, take a tolerable polish, and dissolve readily.

He thinks Chavron's method, used on stone, or even on lead, to be the easiest and cheapest for those who wish to have a card or cyphers. &c. printed. A small piece may be executed in a quarter of an hour; and if wetting is not sufficient to prevent the ink from adhering to the block (in the spaces between the letters) it will bear sponging, and yet leave enough of the ink upon the figures.

Method of Increasing the Durability of Tiles; by Count Von Mellin.

Sonnen's Journal, Oct. 1803, p. 243.

Count Von Mellin thinking the method of increasing the hardness, and consequently the durability of tiles by glazing, not sufficiently cheap and simple for common use, though very effectual, resolved to try the effect of tarring the tiles, which he had heard recommended, on one of his roofs that required considerable repairs.

Having provided some of the largest brushes, he and an assistant set about coating the upper surface of the tiles with tar liquified over a gentle fire, and kept moderately hot. Four persons were employed to hand up the tiles, and when tarred, to lay them in the sun to dry; which took three or four days, it being then the spring of the year. The best of the tiles, or those which appeared most thoroughly baked were set apart (without being tarred) and the others were exposed to the sun, that they might be warmed and receive the coat of tar more easily. After the process these appeared as if coated with a reddish brown varnish. Four hours were sufficient for the preparation of two thousand.

Near the Count's house was a tile kiln, which was just ready to draw. As soon as it was sufficiently cool to allow the tiles to be handled, he had as many taken out, as left in the interior of the kiln, sufficient room

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